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# Weighted blanket – a successful therapeutic tool or solely an effective marketing product? A literature review

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## ABSTRACT

Weighted blankets have recently gained widespread attention as a readily available, economically favorable, and well-tolerated tool. They promise to improve sleep quality and reduce symptoms of multiple stress-related disorders. Weighted blankets help regulate sympathetic and parasympathetic arousal through deep-pressure stimulation. Their use has been positively correlated with sleep efficacy and anxiety reduction in various populations. Weighted blanket use is associated with a reduced need for sleep medications in some populations, as well as a reduction in morphine use in acute trauma patients. Effects on both chronic and acute pain have been noted. Weighted blankets proved to be a successful tool in reducing anxiety before and during medical procedures, improving their tolerance and safety for both the patient and health workers. Weighted blankets are a safe and feasible tool that may help manage anxiety, improve sleep quality, and relieve acute and chronic pain. They are a potentially beneficial adjuvant tool in hospital settings. Populations benefiting from weighted blankets include patients with ASD, ADHD, and other psychiatric diagnoses. More high-quality, large-scale studies are necessary.

**Keywords:** Anxiety, pain, sleep, weighted blanket

## 1. INTRODUCTION

Modern devices that improve sleep quality have gained particular interest in recent years. As such, weighted blankets have been widely used in Attention-Deficit Hyperactivity Disorder (ADHD) since the late 1990s. Primarily a niche tool in clinical settings in occupational therapy, weighted blankets received widespread attention in the late 2010s when they became extensively advertised

as improving sleep quality (Eron et al., 2020). Their popularity has again risen during the COVID-19 pandemic when increased stress levels leading to various mental health complications triggered sleep disturbances in many (Becker, 2022).

Today, weighted blankets have become a readily available, economically favorable, and well-tolerated tool. They promise to improve sleep quality and reduce symptoms of multiple stress-related disorders (Stein-Duker et al., 2024; Zhao et al., 2024). Despite the wide range of effects attributed to weighted blankets, the evidence for their effectiveness is still scarce. In this review, we aim to explain the mechanisms by which weighted blankets impose effects and discuss evidence from the latest literature.

## 2. METHODOLOGY

This article is a comprehensive review of the literature on the clinical effects of weighted blankets and their effectiveness in clinical settings. The authors searched Pubmed and Scopus databases by entering the phrases: "weighted blanket\*" and "deep-pressure therapy" for articles published between January 2020 and November 2024. Additionally, more articles were obtained by screening bibliographies of articles acquired by database searches. The review included randomized controlled trials, cross-over studies, retrospective studies, retrospective follow-up studies, population studies, observational studies, case series.

We included studies focusing on effects on anxiety, pain, sleep – time to fall asleep, sleep depth, and sleep length. We chose studies implementing objective measures but also subjective perceptions. The included studies were not limited to psychiatric patients. We included studies where weighted blanket use was the only and an additional intervention. We excluded case reports and studies with third-party-only subjective questionnaires evaluating the interventions' effectiveness.

## 3. RESULTS AND DISCUSSION

### Clinical effects of weighted blankets

Weighted blankets work through deep-pressure stimulation. This kind of stimulation works by exerting evenly distributed pressure, aiming to mimic the sensation of being hugged (Danoff-Burg et al., 2020). This causes changes in autonomic system function by reducing sympathetic arousal while increasing parasympathetic stimulation. In patients experiencing chronic stress and others with a dysregulation in sympathetic to parasympathetic nervous system arousal, this may help restore adequate excitability and thus reduce both symptoms and potential consequences of stress-related conditions, including hypercortisolism (Becklund et al., 2021; Reynolds et al., 2015).

Additionally, studies show that recovered proper modulation of the autonomic system induces positive changes in cardiovascular performance. Those improvements include decreased heart rate and lowered blood pressure, which in the long term may restrict heart muscle hypertrophy as a complication of prolonged sympathetic arousal (Becklund et al., 2021; Nakada et al., 2023; Park and Lee, 2017). However, deep-pressure stimulation effects on the cardiovascular system have not been scrutinized in enough detail. The primary focus has been on weighted blankets' impact on mental health. The effect of weighted blankets on breathing is also worth noting, as stress often leads to hyperventilation; while at the same time, the weight of a weighted blanket may pose a health risk of suffocation.

We found no direct evidence of an immediate effect of deep-pressure therapy on breathing rate or reducing hyperventilation, potentially limiting anxiety attacks. However, long-term effects on stress reduction may reduce the frequency of anxiety attack occurrence. No increased safety risks have been associated with weighted blanket use (Becklund et al., 2021; Ekholm et al., 2020; Eull et al., 2022; Summe et al., 2020). Weighted blanket use has been associated with changes in certain hormone levels. Until recently weighted blankets' effect on sleep has been attributed to parasympathetic stimulation and reduced anxiety, achieved after a few weeks of usage. However, the results of a study by Meth et al., (2023) suggest that using a weighted blanket at bedtime may lead to increased releases of salivary melatonin as compared to controls using a light blanket.

Despite more noticeable increases reported by the authors, they did not reach statistical significance. Moreover, the experiment included only 26 patients, and data was collected over a short period, with only four days of adaptation period. To establish the effect of weighted blankets on melatonin secretion, more studies over an extended time and with larger sample sizes are necessary (Meth et al., 2023). Weighted blanket use has also been associated with increased oxytocin release. This neuropeptide not only works through its anxiolytic properties but is also considered partially responsible for weighted blankets' role in chronic pain management (Baumgartner et al., 2022).

### Effect on sleep

Weighted blankets have been associated with improved sleep quality, fewer episodes of wake-ups during nighttime, easier falling asleep, and longer time asleep (Table 1). Those effects have been most extensively studied in patients with Autism Spectrum Disorder (ASD) and ADHD (Bolic-Baric et al., 2023; Lönn et al., 2024a; Lönn et al., 2024b). The study by Ekholm et al., (2020) on 126 patients showed promising results for the weighted blankets in patients suffering from insomnia. The examined population included patients with major depressive disorder, generalized anxiety disorder, bipolar disorder, and ADHD. The weighted blanket use resulted in significantly better sleep maintenance.

Additionally, the patients reported a higher daytime activity level followed by a reduction in daytime symptoms of fatigue, depression, and anxiety. These effects persisted during the 12-month follow-up in patients using weighted blankets. In the follow-up study, patients primarily randomized to the light blanket group, who converted to weighted blankets also experienced a decrease in insomnia (Ekholm et al., 2020). The impact of weighted blankets on sleep patterns is not universal across populations. In children with ASD, weighted blanket use showed minimal changes in sleep patterns. Nevertheless, the noted time needed to fall asleep showed a significant drop. Moreover, weighted blanket intervention enhanced morning mood after night use (Gee et al., 2020).

On the other hand, in children with ADHD, weighted blankets proved to be a beneficial non-pharmacological intervention. In a study on 94 children with ADHD weighted blankets induced a significant effect on total sleep efficiency, sleep time, and wake-after-sleep onset but not on sleep-onset latency (Lönn et al., 2024b). The results of available studies are promising, however insufficient to draw definite conclusions and form clinical guidelines. Large-scale studies focusing on chosen populations are necessary to establish the real clinical implications of weighted blankets. Especially interesting and clinically promising have been the results of an observational study by Steingrimsson et al., (2022) which included a total of 1785 adult individuals with a psychiatric diagnosis.

The authors observed a statistically significant decrease in sleep medication use, including benzodiazepine use, among patients prescribed a weighted blanket. The populations prone to this positive change were patients of younger age and diagnosed with unipolar-, anxiety-, post-traumatic stress disorder, and ADHD, while psychotic- and bipolar-personality disorders were not associated with a decreased use of sleep medications. The only sleep medication use that increased in those patient groups was the use of melatonin (Steingrimsson et al., 2022). The results of this study are highly promising as the non-pharmacologic intervention of weighted blanket use could help reduce substance abuse in populations at risk.

On the contrary, in the pediatric population, the introduction of weighted blankets did not reduce the need for sleep medications. Moreover, in children aged 0-12, an increase in the collection of sleep medications after weighted blanket implementation was observed. Such a trend was found in males as well as patients with ASD and ADHD (Cederlund et al., 2023). A recent randomized controlled trial on 102 adults without a psychiatric diagnosis showed significant improvements in sleep quality in the patient group assigned to weighted blanket use compared to the normal blanket group after 1 month of intervention. The patients have also noted significant improvements in daytime sleepiness, fatigue, anxiety, stress, and bodily pain. Actigraphy records have also shown decreases in the mean number of awakenings in the weighted blanket group (Yu et al., 2024).

Further large-scale research is necessary to explore weighted blankets' role in facilitating sleep and to establish their status as an alternative to medication in different populations. Weighted blankets' effects on sleep seem to be more notable in patients with increased sensory sensitivity than the average population. In such patients, suffering from moderate to severe insomnia, weighted blanket use caused decreases in Insomnia Severity Index scores of one level pre- to postintervention. Improvements in sleep quality were followed by increased sleep duration among patients using weighted blankets (Davis-Cheshire et al., 2023; Lönn et al., 2024a). Early adherence to weighted blanket use is considered a good predictor of later adherence and thus improvements in sleep patterns. First responses, visible as reported improvements in sleep quality, have been noted after 4 weeks of weighted blanket use (Lönn et al., 2024a; Yu et al., 2024).

**Table 1** Weighted blankets' effect on sleep when used at night time

Study	Population and duration	Outcome measure	Results
Ekholm et al., 2020	120 adult patients with patients with a psychiatric diagnosis 4 weeks and 12-month open follow-up	Insomnia Severity Index, Day and night diaries, Fatigue Symptom Inventory, Hospital Anxiety and Depression Scale, Wrist actigraphy	Decreased Insomnia Severity Index scores, significantly better sleep-maintenance, higher daytime activity level, reduced daytime symptoms of anxiety, fatigue, depression
Gee et al., 2020	2 pediatric patients with ASD 29 days	Caregiver questionnaires: The Sensory Processing Measure–Preschool version (SPM-P), Children's Sleep Habits Questionnaire, Daily Caregiver Survey; and objective data: The Sense Sleep App	Enhanced morning mood after weighted blanket night use; significantly decreased time to fall asleep
Lönn et al., 2024a	94 pediatric patients with ADHD 16 weeks	Actigraphy, Children's Sleep Habits Questionnaire, child-reported Insomnia Severity Index	Early after 4 weeks of use, a decrease in parent-reported and child-reported sleep problems; greater increases and longer time asleep in weighted blanket-adherent patients
Lönn et al., 2024b	94 pediatric patients with ADHD 4+4 weeks	Actigraphy, Children's sleep habits questionnaire, Insomnia Severity Index and a daily sleep diary	Significant effect on total sleep time, sleep efficiency, wake after sleep, but not on sleep-onset latency
Bolic-Baric et al., 2023	48 pediatric and 37 adult patients with ADHD or ASD Various time	Telephone interview after weighted blanket prescription	Improved ability to fall asleep, sleep the whole night, and relax during the day, improved morning/evening daily routine
Steingrimsson et al., 2022	1785 adult patients with psychiatric diagnosis 2 years	Register- based data of before and after weighted blanket prescription	The number of patients without prescription of sleep medication increased, melatonin prescription increased
Yu et al., 2024	102 adult patients with insomnia 1 month	Actigraphy, Pittsburgh Sleep Quality Index (PSQI), Insomnia Severity Index	Significant improvements in sleep quality; decreased daytime sleepiness, stress, anxiety, fatigue, and bodily pain, decrease in the number of awakenings
Davis-Cheshire	4 adult patients with	Insomnia Severity Index, Tuck	Decreased Insomnia Severity

et al., 2023	insomnia 4 weeks	and Snooze Survey, Consensus Sleep Diary Morning, and Additional Sleep Diary Questions	Score, increased sleep quality, increased time asleep
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### Effect on anxiety

One of the ways weighted blankets impose their effect on improving sleep is the reduction in anxiety levels. Weighted blanket use has shown statistically significant drops in anxiety in adults at an inpatient psychiatric facility. Neither sex nor weight of the blanket (6 and 10 kg, chosen by the patients) caused statistically significant differences in patients' responses (Becklund et al., 2021). These results suggest weighted blankets as a promising alternative to medications and physical restraints (Table 2). Other psychiatric populations in which the effect of weighted blankets on anxiety levels was studied are patients with eating disorders: Anorexia Nervosa and Avoidant–Restrictive Food Intake Disorder.

In a randomized controlled trial on a total of 523 patients weighted blanket use yielded a greater, however not statistically significant, decrease in Beck Anxiety Inventory score over time, as compared to the control group (Ohene et al., 2022). Studies on ad hoc use of deep pressure therapy in the form of weighted blankets in populations undergoing stress-inducing medical procedures also show promising results in terms of anxiety control. They suggest that the achieved reduction in anxiety levels, especially when combined with additional strategies, may be practically useful and limit pharmacological sedation in certain patient groups (Table 2).

A calming effect without interruption to medical procedures has been reported during chemotherapy infusions in oncologic patients and during radiologic imaging (Hermann et al., 2024; Horien et al., 2020; Vinson et al., 2020). Weighted blanket use has also been associated with significant decreases in preoperative anxiety (Payne et al., 2024). More studies are necessary to establish the extent of anxiety reduction by ad hoc weighted blanket use and differentiate between the actual therapeutic and placebo effects. Weighted blankets proved beneficial in reducing the rates of the need for (physical restraint (PS)) in pediatric dental patients during sedation visits.

The PS use decreased statistically significantly, from 78.7% before to 32.8% with the availability of weighted blankets. The regimen did not predict the occurrence of PS. The number of completed teeth treated was not found to be statistically different between cases managed with PS versus those managed without restraint (McBeain et al., 2022). Moreover, new evidence on weighted blankets' role in anxiety and aggression reduction in emergency department patients suggests new directions of research that may greatly increase the safety of both patients and health workers (Dickson et al., 2023).

The use of a weighted blanket is a potentially beneficial non-pharmacological tool for patients suffering from a wide variety of psychiatric disorders associated with increased anxiety and stress levels. Moreover, their use as a sole or additional intervention may be beneficial for non-psychiatric patients undergoing stress-inducing medical procedures. More studies comparing weighted blanket use as an alternative; and additional intervention to medication, are necessary.

**Table 2** Weighted blankets' effect on anxiety

Study	Population and duration	Outcome measure	Results
Becklund et al., 2021	122 patients in psychiatric facility 20-minute interventions	Pulse rate, anxiety was measured using the Spielberger State-Trait Anxiety Inventory shortened form	Significant reductions in anxiety levels, significant decreases in pulse rate
Ohene et al., 2022	523 patients with anorexia nervosa and avoidant–restrictive food intake disorder 1 year at nighttime	Beck Anxiety Inventory	Greater, but not statistically significant decreases in Beck Anxiety Inventory score over time

Hermann et al., 2024	50 adult patients receiving their first and/or second chemotherapy or immunotherapy infusion  Chemotherapy infusion time	Modified version of the Visual Analog Scale for Anxiety, feasibility surveys	Reported reduced anxiety after using a weighted blanket after as compared to before intervention
Horien et al., 2020	Pediatric patients aged 7-17  60-minute study sessions	Head motion tracking, and participants' ability to remain still	Low-motion fMRI data were achieved with improvements in quality under the structured mock-scan among neurotypical and ASD patients
Vinson et al., 2020	58 adult patients receiving chemotherapy infusions  Chemotherapy infusion time	State-Trait Anxiety Inventory for Adults, a 10-item self-reported questionnaire, the Visual Analog Scale for Anxiety	Reduction in anxiety during weighted blanket use
Payne et al., 2024	148 adult patients undergoing elective surgery  Pre-operative period	Patient surveys, clinical observations, monitoring physiological responses	Significantly lower preoperative anxiety scores
McBeain et al., 2022	125 pediatric patients undergoing dental procedures  Dental procedure duration	The need for physical restraint use during moderate sedation dental procedures	Weighted blanket use was associated with a reduction in the need for physical restraint use as protective stabilization during moderate sedation dental visits
Dickson et al., 2023	15 adult patients demonstrating aggressive or violent behaviour  15 or 30 minutes	Spielberger State-Trait Anxiety, pulse measurements, standardized anger assessments	Decreases in anxiety and anger scores greater among weighted blanket user groups

### Effect on pain

The effects of weighted blankets on anxiety, together with their role in the regulation of sympathetic and parasympathetic nervous system arousal have raised questions on their role in pain control. Baumgartner et al., (2022) performed a randomized controlled trial on 94 adults with chronic pain. Patients were randomized into two groups depending on the weight of the weighted blanket used: A 7 kg (heavy) or 2 kg (light) weighted blanket. The blankets were to be used during a short trial and overnight for one week. The researchers measured anxiety and chronic pain both pre- and post-intervention. Patients' ratings of pain intensity were collected daily.

The heavy-weighted blanket use led to significantly greater decreases in broad perceptions of chronic pain compared with the light-weighted blanket use. This reduction was more pronounced in individuals with high-trait anxiety. However, weighted blankets did not affect the pain intensity ratings (Baumgartner et al., 2022). Further studies showed that patients suffering from chronic pain who lack social connectedness report higher levels of pain and greater weights of weighted blankets are necessary for pain reductions (Baumgartner et al., 2023). Weighted blankets have also proved to reduce acute pain in trauma patients successfully (Table 3).

In a recent study, trauma patients who used weighted blankets for five consecutive days were matched with a retrospective cohort not using weighted blankets—their levels of pain and anxiety before, during, and after weighed blanket use were noted. Moreover, the study compared both cohorts' need for morphine and alprazolam for pain management. The patients in acute pain had less opioid use and reported less pain and anxiety when using a weighted blanket. No significant reductions in alprazolam use were noted (Warner et al., 2024). Despite the positive impact on chronic and acute pain in trauma patients, the preoperative weighted blanket use has been associated with a reduction in neither pre- nor post-operative pain (Payne et al., 2024).

**Table 3** Weighted blankets' effect on pain

Study	Population and duration	Outcome measure	Results
Baumgartner et al., 2022	94 adult patients with chronic pain One week at nighttime	Wristwatch fitness tracker to quantitatively measure sleep quality; Visual Analog scale used to rate: anxiety and chronic pain pre- and post-intervention; ratings of pain intensity, anxiety, and sleep daily	Reductions in broad perceptions of chronic pain, no significant alterations to pain intensity ratings, no correlation with sleep and anxiety
Warner et al., 2024	36 adult trauma patients 5 days at nighttime	The change in morphine milligram equivalents and alprazolam milligram equivalents over five days, pain and anxiety questionnaires	A significant difference in morphine milligram equivalents per day; no significant difference in alprazolam milligram equivalents per day change; majority of patients who reported less pain and less anxiety
Payne et al., 2024	148 adult patients undergoing elective surgery Pre-operative period	Patient surveys, clinical observations, monitoring physiological responses	No significant effect on presurgical pain or postsurgical nausea, vomiting, or restlessness

#### Effects on the elderly population

A few studies also explored weighted blankets' potential effects on patients with dementia (Table 4). Their use has been associated with statistically significant decreases in the duration of persistent vocalization in ten minutes following the weighted blanket use. A reduction, however not statistically significant, has also been noted during the ten-minute intervention (Dyon et al., 2021). Given promising evidence of their effect on sleep and anxiety, often compromised in the elderly, weighted blanket use in geriatric populations has become progressively more popular.

Hjort et al., (2022) performed a study aiming to establish the effects of weighted blankets use on 110 elderly nursing home residents. Patients were allocated a weighted blanket of around 10% of each patient's weight. The researchers noted improvements, to the extent varying from small to large, in the patients' quality of life, sleep, nutrition, cognition, and activities of daily living after weighted blanket use. Additionally, the use of psychoanaleptic drugs among patients decreased (Hjort et al., 2022).

**Table 4** Weighted blankets' effect in the elderly population

Study	Population and duration	Outcome measure	Results
Dyon et al., 2021	3 elderly patients with dementia and frequent and intense persistent vocalizations  10-minute-long interventions	Duration of vocalization	Statistically significant decreases in the duration of persistent vocalization after weighted blanket use but not during
Hjort et al., 2022	110 patients >65 years of age with sleep problems  2 weeks	Quality of Life-Alzheimer's Disease Measure, EQ-VAS, The Minimal Insomnia Symptom Scale, e Mini Nutritional Assessment-Short Form, Standardised Mini-Mental State Examination, Katz ADL index	Improved Quality of Life, significantly improved sleep, especially with respect to waking up during the night; enhanced nutrition, improved cognitive ability, decreased psychoanaleptic medication use

#### 4. CONCLUSIONS

The research suggests that weighted blankets are a safe and feasible tool that may help manage anxiety, improve various aspects of sleep, as well as bring relief to both acute and chronic pain. Those effects have been mostly reported in psychiatric populations and patients with ASD, and ADHD. However, adult and pediatric patients without psychiatric diagnoses have also been proven to benefit from weighted blanket use. The reported effects of weighted blanket use are especially noteworthy in terms of possible reductions in medication used for anxiety and pain control as well as sleep management.

Currently, weighted blanket use is not included in any guidelines. More large-scale studies in different populations, with a variable weight of weighted blankets, are necessary. Weighted blankets appear a useful addition; if not an alternative, to pharmacologic interventions for various patients. Further exploration of their role may be highly beneficial in populations with contradictions to pharmacologic interventions or where additional adjuvant therapy could be profitable.

#### Authors' Contributions

Conceptualization: AB and ML; Methodology: JBK, AZ; Software: PK; Validation: ML, AZ and MB; Formal Analysis: JBK, MK, AM, KH; Investigation: MK, MB; Resources: KS, MB; Data Curation PK, KS, KH; Writing – Original Draft Preparation: AB, ML, AM, KH and AZ; Writing – Review & Editing: MB, PK, MK, KH and JBK; Supervision: AB, KH; Project Administration: AB, JBK, AZ, ML, PK, KS, MK, AM, KH, MB.

#### Informed consent

Not applicable.

#### Ethical approval

Not applicable.

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**Conflict of interest**

The authors declare that there is no conflict of interests.

**Data and materials availability**

All data sets collected during this study are available upon reasonable request from the corresponding author.

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